us the use of his telephone for a few hours. The additional service permitted the official in charge to answer the many long-distance calls that were awaiting his attention.

Relieving the excess flood waters that accumulated in the section from Knights Landing to the mouth of the Feather, Fremont Weir discharging into Yolo bypass at the rate of about 67,000 second-feet during the peak flow on the 10th–11th, was the principal source of the water that menaced thousands of acres of the low bypass lands, much of which had already been planted to crops. The greatest monetary loss resulted from the breaking of the levee on Prospect Island, which was planted to asparagus and other truck crops. This island and Little Holland Tract, situated near the outlet of Yolo bypass, were completely inundated. No doubt the relief afforded by the breaking of the levee on Prospect Island, causing the water level to drop about 10 inches, was a factor in saving the nearby Liberty Island from a similar fate.

Aside from the lower Yolo basin area, damage to agricultural lands and growing crops was limited, and mostly confined to small areas adjacent to streams in a few localities. Much of the submerged areas in the valleys were pasture and alfalfa lands where little or no damage resulted, stockmen having moved their livestock to higher grounds when warnings were received. With river stages remaining high for about a month, the continuation of seepage damage to lowlands abutting the levees in the lower valley areas caused considerable concern to agricultural interests.

Torrential local rains in a few foothill sections caused considerable damage in the way of washouts to highways and railroads. Heavy damage was reported to have been done to hillside orchards in Placer County by erosion of topsoil. Minor damage to levees occurred locally on the lower reaches of streams. A break occurred in the north levee of the lower Bear River in the vicinity of Wheatland and a hundred or more acres of alfalfa and orchard land were flooded, but the resultant damage was light. Also little loss resulted from the flooding of considerable acreage along the lower Cosumnes River above its confluence with the Mokelumne, in the lower San Joaquin basin.

The fact that practically all the water of the upper Mokelumne River want into storage in Pardee Dam on that stream, prevented what otherwise would have been a rather serious flood situation on the lower Mokelumne. As it was, the Cosumnes alone caused a near flood at the river station of Bensons Ferry on the lower Mokelumne. On the morning of April 8, cautionary warnings were issued for the streams tributary to the lower San Joaquin River. The Feather and Yuba Rivers were only moderately high. Had they been proportionately high as compared with other streams, the Knights Landing area would have suffered a serious flood and much more destruction would have been caused in the lower Yolo Basin.

With a recurrence of heavy local rains in the American and Bear River areas on April 15, these streams, especially the American, carried considerable water, and with the Sacramento already high, 23.3 feet at 8 a. m. of that date, cautionary warnings were issued to the effect that the river at Sacramento would rise to 26 feet during the night and that a portion of the low area between the two cities would again be submerged, and at the same time advised that the flood-control gates on Del Paso Boulevard be closed.

On the following morning the river at Sacramento peaked at a stage of 26.1 feet. Limited areas of the lowlands adjacent to the north side of the American River were covered with water, but as normal activities in that low region had not been resumed little damage resulted. By the morning of April 18 receding waters permitted the gates of the highway to be opened for traffic.

Five lives were lost by drowning: One at Sacramento when a boat of a rescuing party capsized, three in the vicinity of Lincoln, Placer County, east of Auburn, when local creeks suddenly overflowed their banks, and one at Vina, Tehama County, where a rancher was thrown from his horse while rounding up cattle in the flooded area.

The damage to property as a result of this flood was estimated at $526,150; and the value of the property saved by the Weather Bureau's warnings was estimated to be $318,000.

BIBLIOGRAPHY

C. FITZHUGH TALMAN, *in charge of Library*

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Abercromby, Ralph
Weather; the nature of weather changes from day to day. New ed., rev. and largely rewritten, by A. H. R. Goldie. London, K. Paul, Trench, Trubner & co., ltd. 1934. xii, 274 p. illus. (incl. charts), plates, double chart, diagrs. 22 cm. (Bibliography at the end of all but two chapters.)

Blue Hill Observatory fifty years old. n. p. n. d. 11 p. illus. 25 cm. (Reprinted from The Harvard alumni bulletin.)

Carvalho Andrêa, Á.
Meteorologia e medicina. Lisboa. 1934. 16 p. 25 cm. (Separata de Medicina, revista de ciências mêdicas e humanismo. Lisboa. Julho 1934.)

Fàntoli, Amilcare
L'ambiente agro-meteorologico del Fezzán. Roma. 1930—Anno IX. 13 p. 24 cm. (Estratto dalla Rassegna Economica delle Colonie, maggio-giugno 1930—VIII—nn. 5–6.)
———L'ambiente fisico delle Colonie Libiche nei suoi riflessi demografici e nelle sue influenze sul lavoro indigeno. Roma. 1932—Anno X. 19 p. fold. plate, diagrs. 24 cm.
——— L'organizzazione meteorologica in Libia. Roma. 1929—Anno VII. 8 p. 24 cm. (Estratto dalla Rassegna Economica delle Colonie. Fascicolo 3–4—1929—VII.)
——— Se esista una relazione fra il ciclo undicennale dell' attività solare e le pioggie in Libia. Tripolitania. 1934—XII. 18 p. fold. pls. tables. 21½ cm. (Estratto dal Bollettino Geografico N. 4 dell' Ufficio Studi del Governo della Tripolitania.)
——— Gli studi agro-meteorologici in Libia. Roma. 1932—Anno X. 16 p. 24 cm. (Estratto dalla Rassegna Economica delle Colonie. Luglio-Agosto 1931—IX—n. 7–8.)
——— La zona degli altipiani nord-orientali della Tripolitania. Sguardo climatologico. n. p. n. d. 18 p. fold. plate, tables. 23 cm.

Georgii, W.
Gliding in convection currents. (Luftfahrtforschung. v. II, no. 5, Oct. 25, 1934.) Washington, D. C. 1935. 7 p. pl. 26½ cm. (Nat. adv. comm. for aeron. Techn. memorandums. No. 761.)

Guyot, Edmond
Taches solaires et précipitations. Neuchâtel. n. d. p. 300–305; tables, chart. 24 cm. (Extrait des Annales Guebhard-Séverine. 9me année, 1933.)

Guyot, Edmond, & Godet, Charles
Le climat et al vigne. Berne. 1935. p. 17–68. tables, diagrs. 25 cm. (Tirage à part de l'Annuaire agricole de la Suisse.)

India. Meteorological department
Functions and organisations of the India meteorological department (1935). Simla. 1935. 25 p. 25 cm.

Jemison, George M.
Beaufort scale of wind force as adapted for use on forested areas of the northern Rocky mountains. Washington, D. C. 1934. p. 77–82. tables. 23½ cm. (Journal of agricultural research. v. 49, no. 1. July 1, 1934.)

Kidson, E.
The circulation of the atmosphere in the Australia-New Zealand region. n. p. n. d. p. 661–666. diagrs. 23½ cm.

Koschmieder, H.
Die Meteorologie und ihre Nachbarwissenschaften. Milano. 1934. pp. 118–192. 24 cm. (Extrait de "Scientia"—Février 1934.)

Lagaye, Jean de.
De la visibilité du Mont Blanc, au sommet du Puy de Dôme. Clermont-Ferrand. 1933. 7 p. 24 cm.

Mörikofer, W.
Die klimatischen Voraussetzungen für Kur und Sport in Davoser Winter. Basel. n. d. 5 p. 23 cm. (Sonderabdruck aus der Schwerizerischen medizinischen Wochenschrift. 62. Jahrgang, 1932, Nr. 51, Seite 1196.)

New England Water Works Association
Journal. v. 38, no. 1. March, 1934. Boston. c1924. 102 p. figs. plates (fold.) port. 23½ cm. (p. 1–47: Horton, Robert E.: Determining the mean precipitation on a drainage basin.)

Puppo, Agostino
Radiazione e nebulosità a Conegliano [Venezia.] Tentativo di definizione del clima solare. Venezia. 1934. pp. 515–526. tables. 24½ cm.

Ramdas, L. A.
Micro-climatology. n. p. n. d. 3 p. 25 cm. (Reprint: Current science, v. II, no. 11, May 1934, pp. 445–447.)

Sohoni, V. V.
Weather types associated with nor'-westers in Bengal. Alipore. 1933. pp. 349–357. plates, tables. 24½ cm. (From: Journal & proc., Asiatic socy. of Bengal (new ser.) vol. XXVIII, 1932, no. 1.)

Webb, Gerald B.
The lure of climate. Colorado . . . n. d. 7 p. illus. 25½ cm. (Repr.: Journal of the outdoor life. Special Colorado number, June, 1932.)

Wertheimer, Eduard
Über den natürlichen Ablauf des atmosphärischen Vorgänge und die Möglichkeit einer künstlichen Beeinflussung. Braunschweig. 1933. 16 p. 23 cm.

SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS DURING APRIL 1935

By IRVING F. HAND, *Assistant in Solar Radiation Investigations*

For a description of instruments employed and their exposures, the reader is referred to the January 1935 REVIEW, page 24.

Table 1 shows that solar radiation intensities averaged close to normal for April at both Washington and Madison, and slightly above normal at Lincoln.

Table 2 shows a deficiency in the amount of solar and sky radiation received on a horizontal surface at all stations except Chicago, New York, Fairbanks, and Twin Falls.

Polarization measurements obtained on 6 days at Washington give a mean of 59 percent with a maximum of 64 percent on the 22d and 26th. At Madison the single observation obtained of 51 percent on the 13th is below both the average and the maximum normal for that month at that station. The Washington values are close to the April normals.

Owing to change of personnel at Twin Falls, total solar and sky radiation data were received too late to include in any of the first three issues of the REVIEW for 1935. The values for the first 13 weeks of 1935, expressed in gram calories, are as follows: 180, 142, 175, 199, 264, 106, 306, 294, 305, 306, 405, 388, and 409 with an excess at the end of April of 651.

TABLE 1.—*Solar radiation intensities during April, 1935*

[Gram-calories per minute per square centimeter of normal surface]

WASHINGTON, D. C.

Date	Sun's zenith distance										
	8 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass									Local mean solar time
		A. M.					P. M.				
	e	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e
	mm	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm*
Apr. 2	7.29	------	------	------	------	1.05	------	------	------	------	9.47
Apr. 17	3.99	------	------	0.79	------	------	------	------	------	------	4.75
Apr. 18	4.37	0.55	0.66	.80	1.00	1.33	------	------	------	------	4.57
Apr. 22	6.50	------	------	.76	1.05	1.44	------	------	------	------	5.79
Apr. 23	5.36	.52	.66	.84	1.02	1.38	------	------	------	------	4.75
Apr. 25	6.27	.76	.94	1.06	1.18	1.45	1.12	.95	------	------	3.99
Apr. 26	3.81	.90	.97	1.10	1.29	1.45	------	------	------	------	4.37
Means	------	.68	.81	.89	1.11	1.35	(1.12)	(.95)	------	------	------
Departures	------	−.02	+.03	.00	+.04	−.01	+.02	+.05	------	------	------

[1] Extrapolated.